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Statistical Methods in Plant Taxonomy

by

J. Heslop Harrison (London).

To the systematist concerned mainly with description, naming and determination, the inherent variability of species is often simply an unfortunate complication, to be ignored if possible, and where not, to be taken into account as summarily as circumstances will allow. From this point of view, the ideal species would be one in which all of the individuals conformed to a single pattern, and in which, therefore, the generalisation made from those which happen to have found their way into the herbarium would have complete validity. In such a species there would be no room for differences of opinion — no opening for "splitters". But the individuals of a species never conform in such a manner, and it is in the degree of their departure from the described form that opportunity arises for divergent interpretation. Evidently, if taxonomy is to attain an objective basis and to substantiate its results with other than simple assertions of opinion, increasing attention will have to be given to the methods of definition and circumscription of its units, and particularly of those of the lower ranks, specific and infraspecific. It is irrelevant to this argument that there is so far no single all-embracing definition of what constitutes a species. Whenever a systematist publishes a *"sp. nov."*, he is claiming that in the particular group in which he is working, *he* at least knows what is a species. It does not seem too much to demand of him that he should make some attempt to express his views in such a form that others can interpret the unit which he is proposing to describe, and to estimate at least the probability that any particular specimen belongs within or without this unit.

Particularly is this so in the case of new work upon critical groups in floras already well known. The well defined species in any flora are those which are separated by qualitative features or clear variational discontinuities from all others. Quantitative variation does, of course, exist in such species, but its occurence does not affect their definition. In a critical complex, gross qualitative features cease to be available for characterisation and delimitation. As the discrimination of unlike forms proceeds, the differences observed become less and less pronounced, and the variational discontinuities may actually disappear so that, while it may be clear to a student of the group that two or more forms are still present, there may be intergradation in every morphological character. If such intergrading forms are to be discriminated with any degree of certainty it is not merely desirable but actually essential that some form of statistical definition be adopted.

What form then, must such definition take? Ideally, we might say that the problem is to state what populations we wish to include in our taxon, and to sum up the characteristics of these populations in a set of parameters. Here it seems advisable to draw attention to the different biological and statistical connotations of the term *"population"*. Biologically, in whichever of its many senses the word is used, it is always considered to have a real meaning in that it refers to a group of individuals of finite size. The association of the individuals in a population may be because of their common habitation of a particular definable area, and it is in this sense that the field naturalist would be most likely to use the term. In genetical parlance, applied to sexual organisms, the word is generally used to cover a group of individuals within which gene exchange is possible. In contrast to these biological usages, the population of the statistician is an abstraction: in Mather's

(1946) definition, it is "the hypothetically infinitely large series of observations or individuals of which those observations or individuals actually obtained form a sample." The structure of this statistical entity is deduced from the available sample, but its properties are usually such as are possessed by no real aggregate of individuals.

In describing a biological population statistically, we would in effect be using such data as we care to make use of from our available material to form an estimate of the parameters of the hypothetical infinite population of which our material constitutes a sample. There are no limitations on this process as far as amount of available material is concerned: we can as readily calculate a mean from two individuals as from two thousand. But the extent to which our estimates of parameters of the statistical population would agree with statistics computed from a real biological population of the unit we are attempting to define, were all its individuals available for examination, is dependent on the representativeness of our original sample. Of equal importance is the validity or otherwise of our treatment of the sample data. Deductions about populations made from the data of samples often depend on certain assumptions respecting the distributions of the variates, and unless these assumptions are at least approximately true the deductions themselves become invalid and misleading.

Some understanding of the nature of the variability within the taxa we are attempting to define is thus an essential preliminary to statistical specification. If we consider first a group of organisms possessing the same genetical constitution (i.e., constituting a single biotype) occupying a particular habitat, it is evident that such variability as exists between individuals must arise purely from the diverse environmental influences to which they are exposed during development. For any given attribute, such as overall stature, in which continuous variation occurs, the individuals of such a genetically homogeneous unit at the same stage of development tend to be distributed in a manner which approximates to the normal distribution of a statistical theory. This is largely a matter of empirical observation; that it should be so can be argued from the theory of probability, from which the normal distribution itself is deduced, on the assumption that the influences operative during growth are numerous and all of the same order of magnitude in their effects. The biological importance of this type of distribution was first pointed out by Quetelet, whose name it often bears. The genesis of this and other distributions in biological material is discussed at length by Baas Becking and Drion (1936).

The normal curve of distribution is symmetrical and is defined completely by the *mean* (M) and the *standard deviation* (σ). Although a mathematical abstraction which can never have any real biological meaning since no variate can assume all values, it provides nevertheless the best means of summing up concisely the observations which have been made on the individuals of a group in which there is reason to believe the distribution of variates approximates to this general form, and of estimating the structure of the hypothetical infinite population of which this group forms a sample.

Within such a genetically homogeneous group as that discussed above, environmental influences are likely to produce continuous variation in the sizes of organs, and also in other features such as colour, which, while not so readily assessed in numerical units as size and weight, may nevertheless be considered to vary continuously in that distinct grades separated by discontinuities cannot be recognised. In these features frequency distributions again tend to approximate to the normal curve. In contrast with this type of continuous variation is that shown by such characters as petal number and leaf number where the variate can only assume certain discrete values — the "*meristic*" variation of Bateson. If there be a reasonably large number of such values, and if the mean number is not very small, it is commonly found that the normal curve provides a good enough fit both for description and comparison. Where the number of possible values is small and the mean value low other distributions than the normal may provide a better fit to the observed data.

Genetically homogeneous material is more often the experience of the agronomist than the taxonomist. Nevertheless, there exist many groups in which the recognised taxa are of this nature, forming colonies in which variation is of the type encountered in a field of potatoes or wheat. These are the agamic complexes in such genera as *Rubus*, *Poa* and *Hieracium*, where the majority of taxa are apomictic clones. In sexual breeding species genetically homogeneous colonies are the exception rather than the rule, apart from those

cases where cleistogamy or other forms of obligate self-fertilisation has produced local homozygous pure-lines. Within any amphimictic colony genetical is added to environmental variability, and we have a mixture of biotypes to define rather than the diverse expressions of one. In such a colony, it is sometimes the case that the plants fall into one or two clearly distinguishable classes on the basis of some readily discernible feature — that is, show polymorphism. Among the many instances which the plant kingdom provides, the most familiar examples are probably those involving heterostyly, flower colour differences and leaf shape aberrations, while permanent so-called sexual dimorphism or polymorphism is a feature of all polyoecious species. The origin of such polymorphism may be relatively simple genetically, depending on one or a few pairs or series of allelomorphic genes. Taxonomically, clearly distinguishable biotypes of a non-sexual type are commonly treated as varieties, and because of their clear-cut nature, problems of description do not arise. However, if we wish to extend the study of such polymorphism beyond merely initial description and classification, it may be important to establish the proportional representation of the variants throughout the species area. This can be done by assessing their representation in whole colonies or in representative samples of them. The resultant data can be looked upon either as purely descriptive of each colony, or as providing an estimate of a characteristic of the statistical population from which the sample was drawn. The proportion of variants within a given colony is unlikely in general to fit any particular theoretical frequency distribution. Examples of surveys of this nature are Gregor's study of the distribution of leaf marking in *Plantago maritima* (1938) and Dobzhansky's and Epling's investigation of the incidence of flower colour forms of *Linanthus parryae* in Southern California (1942).

Differences between biotypes in a given habitat grade from those which are clear cut, giving the type of polymorphism discussed above, to those in which the classes cannot readily be distinguished by eye. In the latter case, the superimposed environmental variation within each biotype may totally obscure any variational gap between them, so that the variation appears continuous in the colony as a whole. The hereditary basis of such continuous variation is in no way fundamentally different from that underlying polymorphism: simply more genes are involved with smaller individual effects. Quantitative variation governed by multiple factors (or *polygenes)* is probably the commonest form in nature. If $^{n}/_{2}$ represents the number of pairs of allelomorphic genes governing an attribute and all possess roughly equal effects, then in a population in which they are present in approximately equal numbers, the distribution of the phenotypes will be given by the expansion of the binomial $(\frac{1}{2} + \frac{1}{2})^n$. The limit to which this tends as n is increased (and as the gaps between the classes of phenotypes diminish) is the normal curve. Assuming random mating and the survival of all biotypes, this distribution will be maintained from generation to generation.

Like that arising from environmental influences, genetically based continuous variation within a breeding unit (or *gamodeme)* is thus likely to produce variate distributions conforming approximately with the normal curve. All phenotypic variation of a quantitative nature in such a unit can thus conveniently be summed up by fitting a normal curve to the observed data, and described by calculated estimates of its parameters, M and σ The total *variance* of the distribution, V $(= \sigma^2)$ is actually the sum of that due to genetical causes and environmental causes alone.

While the normal curve is the most useful device for describing continuous variation in natural populations, and is certainly that most likely to be useful in taxonomic work, there are limitations to its applicability which arise from the fact that by no means all biological frequency distributions conform exactly to it, and some in fact deviate to such an extent that its use is definitely misleading. Distributions which are symmetrical but which depart from the normal by being slightly too peaked *(leptokurtic)* or too flattened *(platykurtic)* are no doubt frequent in nature, but from the taxonomic point of view the assumption of normality in such cases is not likely to lead to any important error. This is not so where the observed distribution is asymmetrical *(skewed),* a situation often found with cell lengths, for example. Here the assumption of normal distribution may lead to serious error, particularly where the parameters are not used merely in a descriptive manner but as a basis for deducing characters of the population, for instance in prediction of the expectation of particular classes of variant.

Biometrical evaluation of taxonomic characters

The preceding discussion has been concerned with the variation of plants in a general sense, without reference to specific characters or groups of characters. The problem which arises at the onset of any biometrical investigation is the selection of specific attributes suitable for study, since it is obviously impossible to examine more than a fraction of those in which variation occurs. A double requirement is involved here, namely that they shall be taxonomically significant while yet remaining amenable to biometrical treatment, and a compromise may not always be easy to find.

From the biometrical point of view, the most satisfactory characters are those which can be assessed directly by counting or by simple measurement of linear dimensions or angles. These involve least labour in recording and subsequent computation, and furthermore most frequently possess distributions which approach normality. In relation to the purpose of the study, however, the number and linear dimensions of organs may be the very features which are of least significance. The proper evaluation of taxonomic characters is, of course, a central problem of all systematic procedure, and it is no part of the purpose of this article to discuss the broad aspects of this matter. Generally speaking, a worker in any particular group will possess already an excellent idea of the part of the morphological variation which his material shows which is most likely to prove useful in achieving the aims he has in mind. This is not to say that statistical investigation can be of no service in establishing the relative value of characters as diagnostics beyond what can be learned from the study of individuals, or that it may not reveal diagnostically important characters which might otherwise have been overlooked.

Let us consider first the narrower issue of assessing characters biometrically once they have been selected for study. As suggested above, the cases where linear dimensions and number of parts are the best of all possible criteria are probably infrequent. Nevertheless, such features are often employed in orthodox systematic diagnoses, and biometrical techniques can readily be adapted to examine their value. To quote a few instances from recent work on critical groups: Pavlovska (1947) has shown that *Chrysosplenium alpinum* can be discriminated from *C. oppositifolium* on the basis of several linear dimensions, while Deyl (1946) has shown spike-length and awn size to be taxonomically significant when treated biometrically in the genus *Sesleria*. The diploid and tetraploid spotted orchids, *O. fuchsii* Druce and *O. maculata L.* have for some time been known to possess a different range of leaf number, and statistical study has shown this difference to be significant at any one latitude although not to be adequate to differentiate colonies from widely different latitudes (Heslop Harrison, 1951). Conversely, the distinction between *Nymphaea alba* and the supposed western species, *Nymphaea occidentalis*, based largely upon size and numbers of floral organs, has been shown to have no real meaning (Y. Heslop Harrison, unpublished).

Shape differences are generally of much greater significance than those involving size, and devising methods for the statistical study of such differences is one of the most difficult and yet often the most rewarding of biometrical processes. While it is true that the descriptive language of orthodox systematics is much more capable of calling to mind an image of a particular shape difference than any body of figures, numerical specification is likely to be far more efficient than any verbal description in expressing precisely shape variability in a population. The complete specification of shape is a specialised problem which in recent years has been taken furthest with botanical material by Melville (1937) and Anderson and Hubricht (1938) dealing with leaf shape in *Ulmus* and *Acer* respectively, while similar problems in connection with leaf morphogenesis have been tackled by Ashby *et al.* (1948, etc.) in a series of papers of considerable taxonomic significance.

Such accurate methods as those of Melville and Anderson require a considerable expenditure of time which would make their application to large samples almost prohibitive. It is, however, usually possible to incorporate certain specified measurements of the organ concerned in one or more indices which reflect directly the taxonomically important part of the variation present, and this is the method that has been used in the bulk of such studies. Examples of the use in taxonomy of leaf-shape indices are contained in the work of Anderson and Whitaker on *Uvularia* (1934) and Anderson and Turrill on *Fraxinus* (1938), while they have been used extensively in the analysis of the genetical basis of

shape variation, as for example in *Gossypium* (Hutchinson, 1934). An excellent example of the value of shape indices in investigating geographical variation is Woodson's study of *Asclepias tuberosa* (1947).

Apart from its pertinence to the problem in hand, the characteristics to be sought in an index are rapidity of assessment and repeatability. If dimensions alone are to be incorporated, they are naturally combined in such a manner as to reduce the importance of absolute size as a variable, i.e., the complete index takes the form of a ratio or compound of ratios. The numerator and denominator of the ratio are so selected that the range within which it is likely to vary is easily treated mathematically; for example, when one measurement is likely to fall to zero, this should be used as numerator rather than denominator, since a variate assuming values between zero and some finite figure is more readily handled than one varying to infinity.

The use of ratios is, of course, a common enough practice in orthodox systematic description. It is generally considered that where absolute dimensions vary between wide limits, the ratios of such dimensions may be expected to show greater constancy. This is often more or less true, although it is important to notice that only study of the regression relationships of the dimensions concerned can provide complete information on this point. Measurements combined in ratios may be taken from the same or different structures, and any such combination of measurements can be treated statistically. This may be useful in comparison, but in typification the ratio of the means of two dimensions in a sample may have more biological significance than the mean of their ratios in the individuals.

Apart from the class of characters which can readily be assessed numerically — numbers of parts, dimensions or combinations of dimensions, weights, etc., the taxonomist is concerned with attributes which are not directly measurable: these include such features as colour, patterning, pubescence, etc. Techniques can, of course, be developed for accurate estimation of many of these. Pigments may be extracted and amounts in unit weight or area of organ estimated densitometrically; pubescence may be measured in terms of number of hairs per unit length or area. Even so complex a feature as patterning can be specified with some accuracy with elaborate enough geometrical analysis. But these methods are not fitted for the study of the quantitative variation of such attributes in large samples, where simplicity and speed of assessment is demanded. The method which is most commonly adopted in such cases is to devide the observed range of variation into arbitrary classes, and to place individuals in the appropriate class by simple inspection and comparison. The classes have necessarily to be kept few in number to reduce the chance of personal error and bias, but the grouping can nevertheless be made as accurate as desired if a set of standard cases is assembled to form a reference scale. This is the basis of most methods of colour mensuration, and existing international standards (such as those of Ridgway) can be used as a basis so that both intensity and hue can be defined in terms interpretable by other workers. The estimation of pubescence grades can be simplified in a like manner by comparison with standard examples, which can, if necessary, be defined in absolute terms by actual hair counts and measurement. Patterning can similarly be treated. Simple aspects such as intensity or relative amount of pigment present little difficulty, since here the quantitative basis of the variation is usually reasonably easily recognised (e.g. leaf spotting in *Orchis*, Heslop Harrison, 1948 & 1951). More complex situations often require a careful investigation of the probable causative agencies before the various types of pattern can be defined and the grades recognised be placed in some sort of logical sequence. If such a logical sequence can be found, biometrical treatment can proceed as with a problem in straightforward colorimetry. Alternatively the sequence used may be purely arbitrary, and the grades treated independently as in a case of polymorphism.

The method of arbitrary assessment by comparison can often be extended profitably to other characters in which quantitative variation is found, even where estimation by combinations of linear measurements would be possible. If a sequence of shapes can be defined (ovate through elliptical to obovate in leaf shape might be an example), then a series of typical forms could be selected, and the frequency of occurrence of forms resembling these in a sample estimated by direct comparison. This is likely to be a great deal more rapid than conducting a series of measurements on each individual, and may, for a specific purpose, produce data no less valuable and significant.

The employment in statistical analysis of data relating to the distribution in samples of

arbitrarily graded attributes of the kind discussed above requires careful consideration if biological absurdity is to be avoided. Very often the frequency distributions obtained by such forms of assessment approach the normal curve, and this is to be expected in such continuously varying attributes as flower colour which presumably are governed genetically in a similar manner to features such as linear dimensions. The amount of pigment actually present may not bear a linear relationship to the visual effect it produces and logarithmic transformations may be necessary to obtain a normal distribution, but this can be corrected by appropriate scaling of standards. Where approximately normal distributions are obtained either directly or after transformation, there seems no reason why the ordinary treatment given to linear dimensions and the like should not be applied, and means and standard deviations calculated in terms of grade number. Comparison between populations using these statistics may be quite feasible where a fairly large number of grades has been recognised. Otherwise, it may be that such comparison is better performed by application of some form of χ^2 test.

Where a procedure of grading has been adopted for more complex characters such as patterning, use of methods applicable to the normal distribution may not be justifiable, particularly where inferences are drawn about the population from which the sample was drawn. Estimates of theoretical range in grade numbers, for example, may be biologically pointless, and no meaning can attach to comparisons of variability based upon the coefficient of variation in such cases. Correlation of characters one or both of which is estimated in arbitrary grades is another procedure calling for caution. There are, however, several precedents for the computation of a correlation coefficient, and viewed simply as a test of association the procedure is probably justified when several classes are distinguished. Other methods of testing for association may be more applicable when the number of recognisable grades is small.

Estimation of the relative value of taxonomic characters is a potential function of statistical technique which has so far been little exploited. Anyone concerned with the identification of plants is aware that the "goodness" or "badness" of characters incorporated in diagnoses of closely related taxa depends on the number of correct decisions they allow him to make about the placing of individual specimens. Characters are tested thus by the "user" in a process akin to mass sampling, and there is no reason why they should not be systematically studied by similar methods before diagnoses are drawn up. In general, the grading of characters as differentiae will depend on three factors, (a) the magnitude of differences between the mean expressions in the forms to be discriminated, (b) the intrinsic genetical variability with respect to the characters concerned and (c) the degree to which they are susceptible to environmental modification. The last pair of factors are those which together produce phenotypic variability, and it is doubtful whether any procedure short of experimental cultivation can distinguish their contributions with any degree of certainty. But the systematist is primarily concerned with phenotypes, and his "good" characters will be mainly those which show least phenotypic variability, whatever its source. Plastic characters, and those which show greatest adaptation in diverse habitats always have had and presumably always will have least classificatory value. This fact provides the investigator with an efficient method of estimating the value of differentiae if he is prepared to acquire comparative population samples of the taxa with which he is concerned from dissimilar habitats or microhabitats. An analysis of variance can then be used to test the relative importance of "between" and "within" habitat variation for each character under study, when those showing least between habitat contribution are likely to be those least affected by environment, either by direct modification or through selective adaptation. These characters will be those of greatest systemic value, and it will probably be desirable to use others only in the typification of habitat forms.

Sampling

The application of statistical methods to taxonomic problems automatically brings with it the need for new collecting techniques, for, as it is hardly necessary to point out, the average herbarium collection by its very nature is likely to be unsuitable, consisting as it often does of specimens selected as being "typical", or of aberrants sufficiently far removed from the form regarded as typical to have attracted special attention. The prime requirement for statistical study is a sample of adequate size which is representative of the population —

and what this implies is simply that it shall be truly random. The desirability of assembling such samples in herbaria has been urged by ANDERSON AND TURRILL (1935) and various aspects of a practical nature have been discussed by ANDERSON (1941).

Many characteristics of a living population cannot be estimated from those of a dried sample, and many such features are best recorded in the fresh state. These include dimensions of parts which depend on turgor for their rigidity, colours, patterns, and that important group of characteristics which are usually summed up under the term "habit". Where material is collected for later study, the importance of selecting homologous parts at the same stage of development from each individual cannot be overstressed, nor can the need for adopting standardised methods of preservation if comparative studies are envisaged.

Two kinds of choice are involved in the collection of population samples: choice of the population to be sampled, and choice of the individuals to form the sample. The first is necessarily and desirably subjective. The investigator knows what he wishes to sample, and is best advised to set out by defining the area within which sampling is to be carried out so as to include that population or population-segment with which he is concerned. Habitat conditions can be taken into account at this stage: it may be a deliberate aim to exclude habitat variation as far as possible by choice of a stand in an ecologically uniform area, or it may be intended, in contrast, to investigate habitat variability. After the choice of area has been made, the actual sampling procedure demands objectivity if the result is to be representative and free from personal bias. This will usually mean the adoption of a rigid programme, involving collection along fixed traverses or in quadrats thrown at random.

(To be continued)

PLANT TAXONOMY IN JAPAN

by

EGBERT H. WALKER (Washington D.C.)

Some western botanists have bemoaned the lack of an international perspective in considerable Japanese phytotaxonomic literature. It was my pleasure to be invited, along with Dr RALPH W. CHANEY, to attend the sixteenth annual meeting of the Botanical Society of Japan on September 21-23, 1951, held in Tsuruoka, Yamagata Prefecture, Japan, as a delegate from the Botanical Society of America and from the Pacific Science Board of the National Academy of Sciences in Washington. While attending this meeting, it was evident in various little ways that many Japanese botanists likewise feel the lack of an international trend in some of their botanical literature, and are altering their perspectives. Especially, they are seeking to make closer contacts with botanists of other countries. To aid this, an address book of Japanese botanists has been prepared[1]) so that western botanists can use it. This trend is further concretely expressed in the following abbreviated translation of a short note in Japanese, which appeared in the Journal of Japanese Botany **26** (1): 31-32. January 1951:

"Recommendations on future effective publications in Japan, accepted by the Japan Society of Plant Taxonomists."

"Studies in plant taxonomy have emerged from the static conditions of the war and post-war periods and many reports have appeared in recent years. A few of them were published, unfortunately, in imperfect form. Although the publication of research is entirely free, there are certain international regulations that should be followed and respected. New names which are improperly published will cause confusion in the future and are detrimental to botanical research and international co-operation. The International Rules of Botanical Nomenclature are constantly being improved by taxonomists. It is regretted that Japanese

[1]) Obtainable for $ 1.00 from Prof. H. Hara, Secretary of the National Committee of Botany, Science Council of Japan, whose address is the same as that in the next footnote.

taxonomy is in need of readjustment from this broader viewpoint.

The Japan Society of Plant Taxonomists [1]) considered in 1948 the proper publication of scientific names in order to prevent mistakes and confusion. In 1949 a committee was appointed, including Professors F. Maekawa, H. Hara, Y. Kobayashi, H. Ito, and T. Tuyama, to consider improvements. Their recommendations, discussed in the meeting of November 4, 1950, concerned effective publication of new names, following Article 36 of the International Rules (as adopted by the Amsterdam Congress in 1935), and do not restrict in the least publication of any description, so long as it contains no new names. It is recommended that the international point of view be considered, instead of a narrow national outlook. New names should be presented in publications in strict accord with the International Rules in order to avoid inconveniences.

"The Society, in accordance with this international point of view, recommends that hereafter new names should not be published in the following:

(1) Popular journals, common scientific journals, ordinary books (dictionaries, encyclopedias, etc.) (Examples given.)

(2) Technical non-botanical journals, and journals which do not intend to publish original articles, dissertations, etc. (Examples given.)

(3) Mimeographed publications. (Examples given.)

(4) Publications which cannot be obtained easily by persons concerned with general plant taxonomy (i.e. publications for local members of a society which are not offered for sale, alumni bulletins, reports of natural monuments, etc.). (Examples given.)

(5) Publications that have a very limited distribution abroad. (Examples given.)

There is no objection to using new names for the purpose of some explanations, but those new names should be recognized as valid only when they are published in due form. When new names are published in periodicals of other than phytotaxonomic interest, such as college reports, institutional reports, forestry society journals, and reports of practice forests, it is desirable to distribute reprints to the chief research institutes, both domestic and foreign."

[1]) This Society may be addressed in care of the Botanical Institute, Faculty of Science, University of Tokyo, Tokyo, Japan.

SPECIAL COMMITTEE ON NOMENCLATURE OF CULTIVATED PLANTS

Chairman: Dr W. H. Camp (Philadelphia).
Secretary: Mr W. T. Stearn, Lindley Library, Royal Horticultural Society, Vincent Square, London S.W. 1.

The secretary prepared the following report on the London meeting of this committee, announced in Taxon **1** (2) : 29.

The joint meeting of the Stockholm Bot. Nom. Committee and the London Hort. Nom. Committee held on November 22 to 24, 1951, at The Royal Horticultural Society's Offices, Vincent Square, London, S.W. 1, proved a very satisfactory one. It was well attended and general agreement was reached on all matters discussed; these covered the Appendix VII (Stockholm Revision), additional proposals circulated before the meeting and others made at the meeting. Members present were A. P. Balfour (Slough), B. K. Boom (Wageningen), W. H. Camp (Philadelphia), J. M. Cowan (Edinburgh), J. W. S. Cracknell (London), H. P. Daepp (Münsingen), J. E. Dandy (London), J. S. L. Gilmour (Cambridge), H. G. Hillier (Winchester), N. Hylander (Uppsala), W. E. Th. Ingwersen (East Grinstead), J. Lange (Copenhagen), J. Lanjouw (Utrecht), R. Maatsch (Herrenhausen), J. M. S. Potter (Wisley), W. T. Stearn (London), F. C. Stern (Goring-by-Sea), A. Thorsrud (Vollebekk), R. de Vilmorin (Paris), and R. Zander (Berlin); A. G. L. Hellyer, A. Simmonds and P. M. Synge attended as observers. W. H. Camp was elected Chairman. The presence of Committee members from Denmark, France, Germany, Holland, Norway, Sweden, Switzerland, and the U.S.A. as well as Great Britain ensured that business was conducted on an international basis and resulted in a beneficial exchange of ideas and concepts; the Committee's decisions should therefore be internationally acceptable. The preparation of the report, i.e. a new international code of nomenclature for cultivated plants embodying and correlating these decisions, was left to the Secretary

(W. T. Stearn), W. H. Camp and J. S. L. Gilmour. It is intended that the new code shall be printed and published in April 1952, so that it can be widely circulated and we hope, widely and critically studied by other horticulturists and botanists before the meeting of the International Committee on Horticultural Nomenclature and Registration at the 13th International Horticultural Congress, London, in September 1952.

It was proposed at the November meeting that the name of the London Hort. Nom. Committee, i.e. the committee set up under the auspices of the International Committee for Horticultural Congresses should be *the International Committee on Horticultural Nomenclature and Registration.* This has been officially accepted as a result of correspondence with Dr J. D. Ruys, to whom the Resolutions and Recommendations of the November meeting have been submitted.

Resolutions and Recommendations adopted November 24-26, 1951.

(Item I.). Whereas the joint meeting of these two Committees was carried on in a spirit of complete harmony and whereas such a joint meeting resulted in a beneficial exchange of ideas and concepts between those engaged in various fields of plant nomenclature IT IS RESOLVED that such joint meetings are of great benefit to all concerned and should be continued. IT IS THEREFORE RECOMMENDED that the members of the Committee on the Nomenclature of Cultivated Plants of the International Botanical Congress be invited to attend the International Horticultural Conference to be held in London in 1952 and to participate in the discussions of the Committee on Nomenclature of the International Horticultural Conference to be held in conjunction with the sessions of that Conference.

(Item II). Whereas throughout the joint sessions of these Committees it became increasingly evident that basic lists of names of cultivated material and adequate registry of the names of plants introduced into cultivation are not only of incalculable value to horticulturists but also the key to fundamental stabilization of the names of cultivated plants. Whereas to-day there are complete lists only for relatively few groups of plants and incomplete registry of new introductions IT IS RESOLVED that the International Horticultural Conference should do all in its power to stimulate the production of basic lists and an adequate registry for cultivated plants. To this end IT IS RECOMMENDED that the Committee on Nomenclature of the Horticultural Conference be charged with

(a) furthering the preparation of a series of compendia and lists giving the correct names of plants now in cultivation with relevant synonyms and

(b) that the function of this Committee be enlarged to include a study of ways and means of achieving better and more adequate registry of the names of plants as they are introduced into cultivation.

IT IS FURTHER RECOMMENDED that the name of this body officially be changed to "The International Committee on Horticultural Nomenclature and Registration" and IT IS FURTHER RECOMMENDED that a list of organizations and agencies be drawn up and that these organizations and agencies be invited to send representatives to the meeting of this Committee in London in 1952 for the purpose of co-ordinating and enlarging the registry of cultivated plants.

SPECIAL COMMITTEE FOR FUNGI

Three mimeographed circulars have been sent to the members of this Committee, all three concerning certain names for clavarioid fungi:

M. A. Donk, Bogor, Indonesia: On the Conservation of certain names of *Clavariaceae.*

M. S. Doty, Honolulu, Hawaii: idem.

E. J. H. Corner, Cambridge, Great Britain: Memorandum on the Generic names of *Clavariaceae.*

Recent publications concerning the nomenclature of the fungi:

R. Singer: Die Nomenklatur der Höheren Pilze, in Schweiz. Zeitschr. Pilzk. **29** : 204. 1951.

M. A. Donk: The Generic Names proposed for Hymenomycetes, I: *"Cyphellaceae"*, in Reinwardtia **1** (2): 199-220. 1951.

E. J. H. Corner: Lectotypes in Mycology: A taxonomic proposal, in Nature **168** : 1031. 1951.

Conservation of Generic Names

by

T. A. Sprague (Cheltenham)

When proposing a generic name for conservation, it is essential, as pointed out by Dr Fosberg (Taxon **1** (1) : 15) to indicate its *type;* it is also essential to indicate the precise *circumscription* adopted by the proposer for the genus concerned. In the list of Nomina generica conservanda published in the International Rules, ed. 3, this latter indication was effected — for the Phanerogamae only — by citation of the running number of the genus in Dalla Torre et Harms, Genera Siphonogamarum, as well as by the relevant nomina rejicienda. The fact which must be faced is that, whereas the Rules are applicable to *all* taxonomic classifications, the conservation of a generic name as an exception to the Rules is applicable only with reference to a *particular* classification: thus *Mahonia* Nutt. is conserved, but only for so long as it is treated as a genus independent from *Berberis;* and *Nasturtium* R. Br. is conserved, but only in a restricted sense, excluding the genus *Rorippa.* This is an *inherent* disadvantage of conservation, and cannot be eliminated by re-wording the text of Art. 21, Note 3: it may not be possible to ascertain the precise circumstances in which a generic name ceases to be conserved, unless the limits of the genus have been defined clearly and precisely at the time of conservation. It will probably be agreed that, when doubt arises as to the continued conservation of a generic name against one not included in the list as a nomen rejiciendum, the case should be referred immediately to the appropriate Special Committee, which will submit its decision, via the General Committee and the Advisory Board, to the next ensuing International Botanical Congress.

OBITUARY

Mr J. M. Black, M.B.E., A.L.S. (1855-1951)

The Australian systematic botanist, John McConnell Black, died suddenly at his home in Adelaide, South Australia, on December 2nd, 1951, at the great age of 96. He was the author of the most recent and widely used of the Australian state floras: "*The flora of South Australia*" which was first published by the Government of South Australia in Adelaide as four successive volumes 1922-1929; it was one of a series of authoritative Handbooks of the Flora and Fauna of South Australia issued by the British Science Guild (South Australian Branch). When the issue ran out of print, a Second Edition was prepared by the author, embodying many revisions, changes and additional illustrations; Parts I and II appeared in 1943 and 1948 respectively, and at the time of his death the manuscript of Part III was almost complete; Part IV remains to be prepared, which the Editorial Committee intends to have done. This Flora is the standard work for South Australia and adjacent regions, particularly for semi-desert vegetation.

He also published a smaller book "*The naturalised Flora of South Australia*" in 1909.

Mr Black did not apply himself to botany seriously until 1902, when at the age of 47 he had the means to retire from his twenty years of work as a journalist. His ability and aptitude for study soon made him a very competent systematist. He collected a good herbarium of his own (now bequeathed to the University of Adelaide and added to the Herbarium of the Botany Department in which he was Honorary Lecturer in Systematic Botany); and he contributed a series of about fifty articles on the local flora to the Transactions of the Royal Society of South Australia, of which he became a member in 1907 and President in 1933-4. He worked as an amateur at his home, never as a professional botanist.

In 1930 he attended the 5th International Botanical Congress in Cambridge as representative of various Australian scientific bodies, and in the same year was made an Associate of the Linnean Society of London *honoris causa.* Four Australian scientific societies subsequently honored him by the award of medals, and the King recognised his botanical services to his country with the decoration of Member of the order of the British Empire in 1942.

Born in Scotland, educated at schools in

Scotland, England and Germany (in Dresden), he was trained for a business career; at the age of 22 he went to South Australia with some of his family, became a farmer for five years, after which he joined the literary staff of the leading daily newspapers in Adelaide and also became a parliamentary reporter on the Hansard staff. Black was a good linguist, even studying Arabic, he was one of the first to learn the International Phonetic Script and to apply it to a study of the languages and speech of Australian aboriginal tribes (Trans. Roy. Soc. S.A. 1917, 1920). He had a great capacity for work, building up his herbarium and dealing with a wide botanical correspondence without assistant, secretary, or typewriter.

The help he did obtain from others included contributions to the herbarium from his family and colleagues; drawings for his later illustrations by other artists (he himself did a great many); and assistance from his friends with the exacting proof-reading and indexing of the "Flora", a very few sections of which were written by other specialists; the authorship of this work was wholly a labour of love. The Australian systematic botanists, as a body, esteemed his work and held him in high affection for the generous courtesy with which he placed the great resources of his knowledge at the disposal of enquirers and associates.

C. M. Eardley.

News from the Herbaria

FLORA OF TROPICAL EAST AFRICA

The "Flora of Tropical East Africa" is being prepared at the Royal Botanic Gardens, Kew, under the joint editorship of Dr W. B. Turrill and Mr E. Milne-Redhead. Additional staff to assist with the work has been provided by the Colonial Office. The Flora is to include the flowering plants and vascular cryptogams of Kenya, Tanganyika, Uganda, and Zanzibar.

The Flora is being published by families in the order in which the MSS. are completed. It is hoped that the first part comprising the family *Ranunculaceae* will be published by the time this notice appears. Accounts of other families are in course of preparation, those of the *Oleaceae* and *Marantaceae* being far advanced. Work has started on the *Gramineae, Cyperaceae* and *Orchidaceae,* but some years are bound to elapse before these large families are completed. It is hoped that the *Leguminosae* will be among one of the earlier families to be undertaken.

The editors would be glad to know of the existence of collections from any of the above four territories in any herbaria other than those with which they are already in touch. They are particularly keen to know of the existence of any duplicate sets of plants collected in East Africa by Stuhlmann, Fischer, Holst, Busse, and Goetze, with, if possible, some indication as to the completeness of the sets and the numbers of isotypes they may contain.

RANCHO SANTA ANA BOTANIC GARDEN

The Rancho Santa Ana Botanic Garden, founded in 1927 for investigation on the native plants of California has been located near *Anaheim,* California. It now announces its move to a new site at *Claremont,* California. There it is affiliated with the Associated Colleges of Claremont. The herbarium of Pomona College and research portions of the botany library of Pomona College are being housed in the Garden's administration building and will be combined with the collections of the Garden. The united herbaria will consist of about 400,000 sheets and contain the Marcus E. Jones Herbarium, the Charles Fuller Baker Herbarium, the Frank W. Peirson Herbarium, the Philip A. Munz Herbarium, the Lyman Benson Herbarium, the Russell S. Woglum Herbarium, the C. B. Wolf Herbarium, and the H. J. Ramsey Herbarium; as well as large collections by many other West American botanists such as I. W. Clokey, A. A. Heller, D. D. Keck, C. L. Hitchcock, Aven Nelson, E. L. Greene, Alice Eastwood, J. T. Howell, L. R. Abrams, Roxanna S. Ferris, F. R. Fosberg, and Marion Ownbey. The botanical libraries as such comprise about 10,000 volumes and receive about 250 periodicals.

The Garden occupies a site of 80 acres of land and has constructed very modern greenhouse, lath house and other nursery facilities. The plantings are roughly divided into portions such as experimental plot and

exhibition area to demonstrate things of particular interest to layment, such as ground covers, hedge plants, cactus and succulent garden and specimen trees and shrubs, as well as wild flower beds. The larger portion of the new area, however, is being planted according to the system of plant communities recently proposed by Munz and Keck for the treatment of the California flora. As time passes there will be developed a miniature California flora in so far as this can be grown at one place and will show such groupings as Redwood Forest, Yellow Pine Forest, Oak Woodlands, Chaparral, Pinyon-Juniper Woodland, and other representative California communities. Many thousand plants have already been set out according to this concept.

The members of the scientific staff of the Garden will take part in graduate instruction in botany in the Claremont Graduate School and will co-operate with the botanists of the Associated Colleges in a doctoral program in the fields of Taxonomy, Plant Genetics, Ecology, and Biosystematics. It is planned that later, research work and advanced instruction in Mycology and Morphology will be added.

The journal El Aliso, now nearing the completion of volume 2 is published by the Garden. It is devoted primarily to west coast botany. The Garden welcomes exchange relationships with other journals and institutions.

The new address of the Rancho Santa Ana Botanic Garden is *1500 N. College Avenue, Claremont, California.*

ROCKY MOUNTAIN HERBARIUM

In accordance with his wishes, the herbarium of the late Dr Harry Hapeman of Minden, Nebraska has recently been acquired by the *Rocky Mountain Herbarium* of the University of Wyoming. Professor C. L. Porter estimates that the collection includes about 30,000 mounted specimens.

Dr Hapeman, who died at the age of 92 on October 29, 1950, was a pioneer physician who maintained an active practice in and around Minden for more than 60 years. Botany was his hobby, and this was fostered partly through his friendship with the late Dr Charles E. Bessey of the University of Nebraska with whom he collaborated in producing a flora of southwestern Nebraska about 1890-1892. He collected mainly in Nebraska, Colorado, Wyoming, and Texas, as well as in the Hawaiian Islands; and he exchanged specimens with numerous collectors in other regions. In addition to a detailed representation of the flora of the western Great Plains area, the Hapeman Herbarium includes specimens from a number of other areas, notable among these being a set of Degener plants from Hawaii. Several types and isotypes are included.

AUTHENTIC MATERIAL OF P. HENNINGS' SPECIES OF FUNGI

Mycologists attempting to work with the *Agaricales* of tropical Africa, and to a lesser extent those of other parts of the tropics, are handicapped by the loss with the Berlin herbarium of the type collections of the very numerous species described by P. Hennings. Most of Hennings' descriptions were quite inadequate by modern standards and if they cannot be amplified by reference to authentic material it seems likely that many of his species cannot be recognized again. Before writing them off in this way, however, it is desirable to ascertain if duplicates exist in other herbaria. Kew possesses a few, distributed in Rabenhorst's Fungi Europaei or Zenker's Flora von Kamerun. These are listed below but it may well be that numerous other species are preserved in various continental herbaria. If so it would be a great service to students of agarics if their whereabouts could be made known. The species of which authentic material exists at Kew are:

Lepiota magnusiana P. Henn. (Rab. F. E. 3843), *Pleurotus bipindensis* P. Henn. (Zenker 2000), *Pleurotus importatus* P. Henn. (Rab. F. E. 4248), *Cantharellus pseudocibarius* P. Henn. (Zenker 2457), *Cantharellus violaceogriseus* P. Henn. (Zenker 2011), *Marasmius albofarinaceus* P. Henn. (Zenker 2173), *Marasmius elaeicola* P. Henn. (Zenker 1341), *Marasmius flavidulus* P. Henn. (Zenker 2198), *Marasmius pallide-sepiaceus* P. Henn. (Zenker 2037), *Marasmius pseudocalopus* P. Henn. (Zenker 2158), *Marasmius zenkeri* P. Henn. (ex. Herb. Mus. Bot. Berol. sub n. 286), *Lentinus paradoxus* P. Henn. (Zenker 2012), *Lentinus zenkerianus* P. Henn. (Zenker 2314), *Inocybe flavofusca* P. Henn. (Zenker 2171), *Flammula ochraceo-tristis* P. Henn. (Zenker 2189) and *Flammula zenkeri* P. Henn. (Zenker 2174).

R. W. G. Dennis (Kew).

COLLECTING TRIPS

Himalaya

Au début du printemps, une équipe d'alpinistes suisses partira à l'assaut de certaines hautes cîmes de l'Himalaya.

A cette équipe seront adjoints trois scientifiques: une ethnographe, un géologue et un botaniste, chargés de faire des observations et de rapporter du matériel destiné aux collections genevoises. Il est encore trop tôt pour donner des détails sur l'itinéraire projeté; on peut bien penser que ce ne sont pas les hommes de science qui ont intérêt à faire mystère de leurs projets. Dans leur domaine il n'y a pas encore, — faut-il dire heureusement ou plutôt hélas? je pencherais pour hélas! — une compétition telle qu'on ait besoin de cacher ses buts jusqu'au moment de leur réalisation. Il n'en va pas de même pour les alpinistes qui, ayant intérêt à arriver les premiers, ne tiennent pas à être devancés. Tout ce qu'on peut dire pour l'instant c'est que l'approche se fera par le Népal, que l'ethnographe (doublée d'une anthropologiste) restera dans le fond des vallées c'est à dire près des gens à mesurer et des objets à ramasser, que le géologue s'efforcera de suivre les alpinistes aussi loin et aussi haut qu'il pourra, tandis que le botaniste ne dépassera pas les limites de végétation. Les collections qu'il rapportera seront étudiées et déposées au Conservatoire botanique de Genève; des doublets (s'il y en a) seront échangés avec les institutions qui s'intéressent à ces régions-là.

CHARLES BAEHNI.

Ryukyo Islands

Dr EGBERT H. WALKER, of the Smithsonian Institution in Washington, collected plants from mid-June through mid-September 1951 in the islands of the southern Ryukyu chain: Okinawa, Miyako, Ishigaki, Iriomote, and Yonaguni. Associated with him were the Okinawan botanists S. TAWADA, T. AMANO, and S. SONOHARA.

This collecting trip was part of the SIRI Program (Scientific Investigation of the Ryukyu Islands) under the Pacific Science Board of the National Academy of Sciences in Washington, operating under contract with the U.S. Army. About 8,000 specimens were prepared. These were obtained, in the first place, to help substantiate a manuscript Flora of Okinawa prepared by these Okinawan botanists. This Flora will be a basic tool in the economic and scientific development of this area, where much botanical work remains to be done to supplement that which many Japanese botanists have done in previous years. A number of additions to the Ryukyu flora have been noted as a result of this summer's field work. Duplicate specimens will be distributed by the Smithsonian Institution to various herbaria.

"FORTSCHRITTE DER BOTANIK"

Dr K. SUESSENGUTH, Botanische Staatssammlung, Menzingerstrasse 67, München, is preparing the report on the taxonomy of the Angiosperms in RENNER and GÄUMANNS *"Fortschritte der Botanik"*.

He would much appreciate receiving taxonomical papers for review in this report. If no separates are available, he would be grateful for the communication of the full titles of the papers concerned with indication of journal, volume, year, page, etc.

REVISIONS IN PREPARATION

Catalpa

Dr JIŘÍ PACLT, of the Wood Research Institute, Bratislawa, Czechoslovakia, published a *"Synopsis of the genus Catalpa (Bignoniaceae)"*; Part 1 appeared in Studia bot. čechoslovaca **12** : 255-260. 1951, Part 2 in Ber. schweiz. bot. Ges. **60** : 591-595. 1950, Part 3 in Candollea **13** : 241-285. 1951, and Part 4 in Sydowia **5** : 160-168. 1951. Part 5 is in the press (Biol. Jaarb.). The monograph, of which also a summary has been published in Acta Fac. Rer. natur. Univ. carol. **194** : 79-81. 1949, will be completed at a later date with a Supplement (Part 6).

Thus, it is still well possible to send him material for revision and additional information.

Anthocerotales

Mr J. PROSKAUER, Assistant Professor of Botany, Department of Botany, University of California, Berkeley, is undertaking a world-wide revision of the *Anthocerotales*.

Flora Malesiana

A great number of revisions of Malesian plant genera is mentioned in Flora Malesiana Bulletin **9**: 286-288. Febr. 1952.

NEW TAXONOMIC LITERATURE

Taxonomy of Vascular Plants

GEORGE H. M. LAWRENCE, Taxonomy of Vascular Plants. The Macmillan Cy., New York, Sept. 1951.

Provides in Part I (Principles and Practices of Plant Taxonomy) a comprehensive account of the theory, principles and working methods followed in plant taxonomy. Special chapters are devoted to e.g. History of Classification, Current Systems of Classification, Biosystematics and Cytogenetics, Plant Nomenclature, Plant Identification.

Part II (Selected Families of Vascular Plants) provides technical descriptions for a large number of families (those known from North America) with notes on distribution, mutual relationships and economic importance. Two appendices give a syllabus for an elementary course and an illustrated glossary.

Lophopyxidaceae

H. H. PFEIFFER (Bremen), in Rev. Suramer. de Botánica, Vol. X, n. 1 proposes to put the genus *Lophopyxis* Hook. f., the systematic position of which has been much disputed, in a separate family: *Lophopyxidaceae* H. Pfeiff. A latin diagnosis and some anatomical and embryological details are provided. The family consists of one genus with 2 species.

Piperaceae

WILLIAM TRELEASE and TRUMAN G. YUNCKER, The Piperaceae of Northern South America; University of Illinois Press, Urbana, U.S.A. (2 Volumes, 838 p.p., 674 fig.).

Amaryllidaceae

HAMILTON P. TRAUB, A revision of the Tribe Ixiolirieae; (Herbertia 9 (1942): 53-59. 1943).

HAMILTON P. TRAUB, A revision of the genus *Zantedeschia* (Plant Life 4 (1948): 9-32; 47-48. 1949).

HAMILTON P. TRAUB and HAROLD N. MOLDENKE, A revision of the Tribe Galantheae (Herbertia 14 (1947): 85.116.1948).

HAMILTON P. TRAUB and HAROLD N. MOLDENKE, A revision of "Amaryllidaceae: Tribe Amarylleae", publ. by American Plant Life Society, Box 2398, Stanford, Calif. 1949, pp. 194, 15 plates, 3 text-figures.

The other tribes of the Amaryllidaceae are in manuscript form and will be published as soon as practicable.

Flora Malesiana

C. G. G. J. VAN STEENIS, Flora Malesiana Vol. 4, part 3; Noordhoff-Kolff N.V., Groningen-Djakarta, Dec. 1951.

Dilleniaceae by R. D. HOOGLAND (Leiden).

Caprifoliaceae by J. H. KERN (Bogor) and C. G. G. J. VAN STEENIS (Leiden).

Polemoniaceae, Crassulaceae, Elatinaceae, Hydrophyllaceae, Juncaceae, Pedaliaceae, Cannabinaceae, Salvadoraceae, Punicaceae, Phytolaccaceae, Sparganiaceae, Turneraceae, Bixaceae, Typhaceae, Flagellariaceae, Callitrichaceae, Valerianaceae, Pontederiaceae, Aizoaceae, Myricaceae, all by C. A. BACKER (Heemstede).

Dipsacaceae, Corynocarpaceae by C. G. G. J. VAN STEENIS (Leiden).

Myoporaceae by S. BLOEMBERGEN (Bogor).

Sonneratiaceae by C. A. BACKER (Heemstede) and C. G. G. J. VAN STEENIS (Leiden).

Dioscoreaceae by I. H. BURKILL (Leatherhead).

Gnetaceae by F. MARKGRAF (München).

Cape Flora

ELSIE GARRET RICE and ROBERT HAROLD COMPTON, Wild Flowers of the Cape of Good Hope, Issued by the Botanical Society of South Africa, Kirstenbosch, S.A., 24 pp., 250 coloured plates.

Gramineae

P. JANSEN, *Gramineae* in Flora Neerlandica, published by the "Koninklijke Nederlandse Botanische Vereniging", Vol. I, part. 2, Amsterdam 1951, 272 pp., 219 fig. (see also Taxon I, 2, p. 24).

Algae

GILBERT M. SMITH et al., Manual of Phycology, an introduction to the Algae and their biology. Edited by GILBERT M. SMITH in co-operation with several specialists. Waltham, Mass., U.S.A. 1951, Chronica Botanica Company, 375 pp., 48 fig. (A new Series of Plant Science books, Vol. XXVII).

"This book is a companion volume to the *Manual of Bryology* and the *Manual of Pteridology* edited by Frans Verdoorn".

"Pflanzensoziologie"

Prof. Dr J. BRAUN-BLANQUET, *Pflanzensoziologie, Grundzüge der Vegetationskunde.* Zweite, umgearbeitete und stark vermehrte Auflage, mit 350 Textabbildungen, XI, 631 Seiten, 15.5 x 23 cm, Herbst 1951. Springer-Verlag, Wien.

PERSONALIA

Mr J. B. Gillet left England on 4.2.52 for 14 months attachment to the Kenya-Ethiopia Boundary commission. His chief object will be to obtain as complete a collection as possible of the plants of Northern Kenya for use in the preparation of the Flora of Tropical East Africa which is now proceeding at Kew. He hopes also to collect, if local conditions permit, in Southern Abyssinia and Somalia whose floras are very badly represented in British herbaria. His address while in the field will be c/o Kenya-Ethiopia Boundary Commission, *Moyale, N. Kenya.*

Mr W. T. Stearn will come on the staff of the British Museum (Natural History), London, effective April 1st 1952.

Mr A. Melderis has recently come on the staff of the British Museum (Natural History), London.

Dr Alicia Lourteig arrived in the U.S.A. on 20 January 1952. She worked for some weeks at the New York Botanical Garden and moved in February to the Gray Herbarium of Harvard University, where she will be staying for a year.

Mr R. Hoogland, scientific staff member of the Flora Malesiana, was awarded the doctor's degree in Jan. 1951 on a thesis: "A revision of the genus Dillenia".

Prof. Albina Messeri has recently been appointed Director of the Istituto ed Orto Botanica, Messina, Italy.

Mr Paolo Sorrenti has been appointed Curator of the Herbarium of the above-mentioned Institute.

Mr B. L. Burtt, has been appointed Principal Scientific Officer, Royal Botanic Garden, Edinburgh.

Mr D. M. Henderson, has been appointed Scientific Officer, Royal Botanic Garden, Edinburgh.

Dr Th. Weevers, Emeritus Professor of Botany, University of Amsterdam, died 15 January 1952. The deceased, although a physiologist by profession, did much to promote the study of the flora of the Netherlands; he was Chief Editor of the "Flora Neerlandica".

Dr S. J. van Ooststroom, Senior curator, Rijksherbarium Leiden, has been appointed Senior Lecturer in Taxonomy at the State University, Leiden.

Mr W. Meijer was awarded the doctor's degree in Dec. 1951, on a thesis: "The genus Orthodontium". He has recently come on the staff of the Herbarium of the Kebun Raya Indonesia, Bogor.

Dr L. E. Codd has been appointed Curator of the Division of Botany, National Herbarium, Pretoria.

Mr H. T. Yost has been appointed Curator of the Amherst College Herbarium, Mass.

Mr G. T. Jones has been appointed Curator of the Oberlin College Herbarium, Ohio.

New Institute-Members

Gray Herbarium, Harvard University, Cambridge, Mass. U.S.A. (R).

Chicago Natural History Museum, Chicago, Illinois, U.S.A. (R).

Museo Botanico, Lisboa, Portugal (A).

Instituto Antonio José Cavanilles, Madrid, Spain.

"*.....Crescat!.....*"

On 1 February 1952 435 taxonomists from 39 countries had joined the I.A.P.T. The numbers per country are as follows:

U.S.A. 151; United Kingdom 50; Netherlands 35; Canada 33; Sweden 26; Cuba 13; Belgium 11; Germany 9; Egypt 8; Portugal 8; Indonesia 7; Switzerland 7; Argentina 6; France 6; Norway 6; Spain 6; Austria 5; Brazil 5; Finland 5; Italy 5; Australia 4; India 3; Union of South Africa 3; Burma 2; Chile 2; Czechoslovakia 2; Denmark 2; Ecuador 2; Ireland 2; Israel 2; Japan 2; Honduras 1; Kenya 1; Marocco 1; Philippines 1; Portuguese East Africa 1; Roumania 1; Singapore 1; Thailand 1.

Regnum Vegetabile

Vol. I *Seventh International Botanical Congress, Section Nomenclature;* report by J. LANJOUW, Rapporteur Général.

The publication of this first volume, which will be distributed *free* to all Members of the I.A.P.T., is suffering a delay beyond the powers of the Editors of Regnum Vegetabile. This report is a reprint from the Proceedings of the Stockholm Congress.

Vol. II. *Index Herbariorum.* A guide to the location and contents of the World's Public Herbaria, edited by J. LANJOUW Ph. D. *Part 1. The Herbaria of the World,* by J. LANJOUW Ph. D. and F. A. STAFLEU Ph. D.; XVI and 167 pages; 16 x 24 cm; 15 February 1952. Details about contents and *prices for members* are given on p. 41 of Taxon no. 3. Price for *non-members:* Dfl. 13.30. Orders can be sent to the *office* of the I.A.P.T.

Membership

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Payments can be made in any currency; remittances in other currencies than those listed above are also accepted (against the exchange rates of the day of payment).

Office

The International Bureau for Plant Taxonomy and Nomenclature, 106 Lange Nieuwstraat, Utrecht — Netherlands.

Taxon

Copy for the next issue of Taxon should be forwarded to the editors before the first day of each *even* month.

FINANCIAL AGENTS

The editors of Taxon are very pleased to state that Mr A. A. BULLOCK, Kew, Dr WALTER DOMKE, Hamburg, and Mr Bo PETERSON, Lund, have offered to act as financial agents for their respective countries.

Austria: Dr K. H. RECHINGER, Naturhistorisches Museum, Botanische Abteilung, Burgring 7, Wien.

Belgium: Prof. W. ROBYNS, Rijksplantentuin, 236 Koninklijke Straat, Brussel.

Canada: Prof. J. ROUSSEAU, Montreal Botan. ical Garden, 4101 Sherbrooke Street East, Montreal, Que.

Egypt: Dr MOHAMMED DRAR, Fouad I Agricultural Museum, Dokki, Cairo.

Germany: Dr WALTER DOMKE, Staatsinstitut für Allgemeine Botanik, Jungiusstrasse 6, Hamburg 36.
Die deutschen Mitglieder werden gebeten ihre Beiträge für 1952 in D. Mark (1$ = DM. 4.20) an Dr Domke zu senden.

Great Britain and British Overseas Territories: Mr A. A. BULLOCK, The Herbarium, Royal Botanic Gardens, Kew Richmond, Surrey, England.
Mr Bullock requests that cheques, etc. for subscriptions and publications other than "Taxon" be made payable to him and crossed "a/c I.A.P.T.". He will also receive applications for membership and orders for publications. Changes of address should be notified immediately.

Italy: Prof. R. E. G. PICHI SERMOLLI, Herbarium Universitatis Florentinae, Istituto Botanico dell'Universitá, Via Lamarmora no. 4, Firenze.

Netherlands: The International Bureau for Plant Taxonomy and Nomenclature, Lange Nieuwstraat 106, Utrecht. Bankers: Messrs. Vlaer & Kol, Utrecht, giro 7247.

Norway: Prof. K. FAEGRI, Universitet I Bergen, Botanisk Museum, Bergen.

Sweden: Mr Bo PETERSON, Botaniska Museet, Lund. Postgiro 43.35.39.

U.S.A.: Dr R. C. ROLLINS, Gray Herbarium, Harvard University, 79 Garden Street, Cambridge 38, Mass.

"Taxon" is directed by: Prof. J. Lanjouw, Chief Editor, and Dr F. A. Stafleu, Assistant Editor. All correspondence should be sent to the International Bureau for Plant Taxonomy and Nomenclature, 106 Lange Nieuwstraat, Utrecht — Netherlands.
All members of I.A.P.T. receive "Taxon" free of charge. Copies of personal members are for private use only and should not be placed in official libraries.